dogs, these animals developed a pronounced acute nephritis, evidenced by the appearance of albumin and numerous casts in the urine, together with a marked hæmoglobinuria. Control experiments made by injecting dogs with the serum of normal rabbits produced no such effect. Since the heteronephrotoxic serum was hæmolytic *in vitro* for dog's erythrocytes it was thought that possibly a part of the renal disturbance might be dependent upon this factor; and to exclude this possibility the dog's kidneys were thoroughly washed before the immunizing doses were given to rabbits. By this means a serum was produced in rabbits which set up an intense albuminuria with numerous casts, both conditions persisting for many days, but did not give rise to hæmoglobinuria. The histological lesions in the kidneys resulting from the injections of this toxic serum consisted in an extensive granular degeneration of the convoluted tubules and a fatty metamorphosis limited almost exclusively to the loops of Henle. Granular and hyaline casts were found in the tubules of the kidney, and minor changes occurred in the glomeruli. The heteronephrotoxic serum was found to be active after heating for half an hour at 56° C. Serum prepared from the cortex of the kidney proved to be much more toxic than that obtained by injections of the medullary portions. If the liver of dogs, instead of the kidney, was used for immunizing purposes a serum was obtained which gave rise to symptoms and lesions; when injected into dogs, similar to those called forth by inoculations of heteronephrotoxic serum. In the course of the experiments several dogs were found which were the subjects of a spontaneous nephritis; and it was discovered that their blood serum was capable of giving rise to an acute nephritis when injected into healthy dogs. This effect could be produced even to the second remove. All attempts to produce chronic renal lesions by successive inoculations of heteronephrotoxic sera were unsuccessful. No immediate effect was noted upon the blood pressure following injections of heteronephrotoxic sera into dogs or of isonephrotoxic sera into rabbits. From the foregoing experiments the author believes that the correlative action of different kinds of serum upon different body cells is demonstrable and that specificity is a function of receptors and not of cells in their entirety.

HYGIENE AND PUBLIC HEALTH.

UNDER THE CHARGE OF

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Effects of Compressed Air on the System.—DRS. LEONARD HILL and J. J. R. MACLEOD (*Journal of Hygiene*, October, 1903, p. 401) have made an experimental study of the action of compressed air, which leads them to the conclusion that with proper choice of men and regulation of the shift and decompression period work can be carried on without loss of life at a depth as great as 200 feet, at which depth the pressure will exceed 100 pounds per square inch, or about 7 atmospheres. Their experiments with animals show that compressed air above 5 atmospheres lessens the output of carbon dioxide and lowers the body temperature, and that oxygen at and above 1 atmosphere has the same effect. It is a sign of oxygen poisoning. Compressed air at 10 atmospheres is more damaging, at least to small animals, than oxygen at 2 atmospheres. It increases the loss of body heat, because it is a better conductor and because it is saturated with moisture. The saturation of the air in caissons with moisture does not prevent evaporation from the body, because the skin temperature is higher than that of the air, and the wet air increases the heat loss by dampening the clothes or fur. Highly compressed air may possibly interfere with the diffusion of carbon dioxide from the alveolar air, and may, owing to increased friction, hinder the passage of air in and out of the air-tubes. The nitrogen output in dogs is not altered in any noteworthy degree by exposure to 8 atmospheres for six hours. Inflammation and consolidation of the lungs are produced by exposure to 8 atmospheres for twenty-four hours, or to 1.5 atmospheres of pure oxygen; and the higher the oxygen tension the more rapidly the inflammation ensues. It does not seem likely that inflammation of the lungs is produced with the pressures and length of exposure usual in caissons. The cause of caisson sickness is the escape of gas bubbles in the bloodvessels and tissue fluids during decompression, but recompression causes them to go into solution again, and if it is applied quickly enough the circulation rebegins. After death following rapid decompression, the bubbles can be seen in the bloodvessels, heart, retinæ, aqueous humor, connective-tissue spaces, and elsewhere, and the alimentary canal is blown out with gas. The varying symptoms of caisson sickness are due to the varying seat of the air emboli. Owing to the elasticity of their tissues and to the greater facility for collateral pathways of circulation, young men escape the sickness, so that by choosing suitable men and regulating carefully the periods of compression and decompression, caisson and divers' sickness can be avoided. Gradual decompression is most important, and, provided two hours are spent in decompression, animals can safely be exposed to 8 atmospheres for four hours.

Factors which Determine the Local Incidence of Fatal Infantile Diarrhœa.—DR. H. MEREDITH RICHARDS (*Journal of Hygiene*, July, 1903, p. 325) calls attention to the fact that the various problems of infantile mortality are, with the continued fall in the birth rate, calculated to assume even greater practical importance in the near future, and that of these problems none is more in need of solution than the exact etiology of infantile diarrhœal diseases. He discusses the influence of methods of feeding, seasonal incidence and meteorological relations, influence of social status, physiography, pollution of the soil and its effects, and concludes that fatal infantile diarrhœa is usually a form of food-poisoning; that infection usually takes place at the home; that urban conditions are chiefly hazardous from the amount of polluted soil found in the roads and yards of urban districts; that infinite care is needed if babies are to be hand-fed in towns; and that practical preventive measures should include (*a*) impermeable roads with efficient channelling, (*b*) copious swilling of roads, (*c*) education of mothers as to the necessity of scrupulous cleanliness, (*d*) the co-operative or municipal provision of specially prepared modified milk, which should be sterilized